



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,469	03/15/2004	Kirk E. Cooper	0315-502/COA	1517
27572	7590	07/30/2004	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			SAVAGE, JASON L	
			ART UNIT	PAPER NUMBER

1775

DATE MAILED: 07/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/800,469	COOPER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jason L Savage	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 44-46 is/are allowed.
- 6) ☒ Claim(s) 1-19, 21-34, 36-40, 42 and 43 is/are rejected.
- 7) ☒ Claim(s) 20, 35 and 41 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5-26-04</u> . | 6) <input type="checkbox"/> Other: ____  |

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1, 6, 10, 12-17, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Eder (US 3,092,306)

Eder teaches a protective coating for a compressor (col. 1, ln. 1-4) wherein the coating is formed by roughening the compressor surface to increase the adhesion of an aluminum coating which is formed by spraying (col. 2, ln. 61-72). The porous aluminum coating is subsequently coated with an organic layer (col. 2, ln. 45-55).

Regarding claims 2-5 and the method limitations contained therein, the claims are drawn to a product, not the method of making. Absent a teaching of the criticality of the specific spraying methods which are claimed, they do not provide a patentable distinction over the prior art.

Regarding claim 10, since Eder does not teach that the aluminum material is an alloy, it should meet the claim limitation of being at least 99% aluminum.

Regarding claims 12-14, the claimed properties would have been inherent since Eder teaches the same method of forming the metal layer by spraying as well as roughening the compressor surface to increase the adhesion of the metal layer.

Regarding claim 21, Eder is silent to the organic layer being capable of withstanding exposure to greater than 300°F without degrading. However, Eder does teach that the materials used for the organic layer are epoxy or silicone resins (col. 3, In. 24-28). Such resins would inherently be capable of withstanding exposure to the claimed temperature.

3. Claims 1-2, 6-9 and 12-14, 16-18 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamada et al. (US 6,337,141)

Yamada teaches a compressor having a flame sprayed aluminum coating (col. 2, In. 15-21). The aluminum coating also has an overlay coating which may contain a mixture of an inorganic solid carrier lubricant and an organic resin compound (col. 5, In. 56-63).

Regarding claims 7-9, Yamada teaches that the sprayed aluminum alloy may contain magnesium, but that it should be in an amount less than 3% (col. 3, In. 57-61).

Regarding claim 12, Yamada teaches the surface of the compressor is roughened prior to spray coating which provides the coating with an adhesive strength of 30 to 60 MPa which meets the claim limitations (col. 5, In. 36-50).

Regarding claims 13-14, the claimed properties would have been inherent since Yamada teaches the same method of forming the metal layer by spraying as well as roughening the compressor surface to increase the adhesion of the metal layer.

Regarding claims 17-18, Yamada teaches that the resin may contain inorganic particles such as solid lubricants (col. 5, ln. 56-58).

Regarding claim 21, Yamada teaches that the coating is typically applied by spraying the coating materials at temperatures of 700°C or higher (col. 2, ln. 18-33). Since the materials do not appear to have any adverse affects at these temperatures, it would be reasonable to expect that the coating of Yamada would be able to withstand temperatures of greater than 300°F without degradation.

4. Claims 1, 11-14, 16-18 and 21 are rejected under 35 U.S.C. 102(a) as being anticipated by Kanayama (US 6,123,009).

Kanayama teaches a compressor which has a protective coating layer (col. 2, ln. 6-10) which is formed by flame-spraying copper onto the compressor having a thickness between 1-1000  $\mu\text{m}$  which completely encompasses the thickness range claimed by Applicant (col. 3, ln. 43-55). The copper layer is then coated with an organic layer which may have a solid inorganic carrier lubricant particle contained therein (col. 3, ln. 63-67). Kanayama also teaches that the compressor substrate may be roughened to improve the adhesion of the metal coating layer (col. 3, ln. 3-8) and that the adhesion may be further improved by inserting an intermediate layer between the compressor and the metal coating layer (col. 3, ln. 56-62).

Regarding claims 12-14, the claimed properties would have been inherent since Kanayama teaches the same method of forming the metal layer by spraying which would form a porous layer containing flat drops as well as teaching roughening the compressor surface to increase the adhesion of the metal layer.

Regarding claim 21, Kanayama teaches that the lubricant coating is baked at a temperature of 170°C and preferably 190°C or higher (col. 5, ln. 66 - col. 6, ln. 3). Therefore, the organic surface layer would be able to temperatures of greater than 300°F without degradation.

5. Claims 1, 6, 12-14, 16-19 and 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Sugiura et al. (US 6,378,415).

Sugiura teaches a compressor provided with a protective coating (col. 1, ln. 7-12). The coating is formed from by spraying aluminum alloy particles which are admixed with an organic material such as polyimide resin containing aluminum particles onto the compressor surface forming a film having a thickness of 50  $\mu\text{m}$  (col. 6, ln. 5-17).

Regarding claims 12-14, the claimed properties would have been inherent since Kanayama teaches the same method of forming the metal layer by spraying which would form a porous layer containing flat drops as well as teaching roughening the compressor surface to increase the adhesion of the metal layer.

Regarding claim 21, since Sugiura teaches a surface layer is made of the same materials as that claimed by Applicant, it is expected to be able to withstand the same high temperatures as the claimed invention.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 11-14, 16-18 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 5,223,052).

Yamamoto teaches a method of treating surfaces of compressors parts (col. 1, ln. 7-13). The compressor surface is treated by forming a porous nickel plating layer and coated with an organic based layer which contains inorganic particles such a BN and MoS<sub>2</sub> (col. 4, ln. 48-54).

Yamamoto does not teach that the metal layer is formed on the compressor by spraying; however, it is known in the art that thermally spraying processes will form in porous coatings. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used any known coating process which could form the porous nickel coating on the compressor.

Regarding claims 2-5 and the method limitations contained therein, the claims are drawn to a product, not the method of making. Absent a teaching of the criticality of

the specific spraying methods which are claimed, they do not provide a patentable distinction over the prior art. When there is a substantially similar product, as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that same process of making, see *In re Brown*, 173 U.S.P.Q. 685, and *In re Fessmann*, 180 U.S.P.Q. 324.

Regarding claims 11 and 22, Yamamoto is silent to the thicknesses of the individual coating layers. However, it is the position of the Examiner that, absent a showing of the criticality of the claimed layer thicknesses, such thicknesses would merely be a design choice and are not seen to provide a patentable distinction over the art of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used any thickness of each material layer so long as it provided sufficient protection to the compressor substrate.

Regarding claim 12, although Yamamoto is silent to the specific adhesion level but it does teach that higher adhesion levels may be obtained by heat treating the composite (col. 4, ln. 36-45). It is the position of the Examiner that the adhesion level of the metal coating of Yamamoto would have just as high of an adhesion level as compressor of Applicant since they have the same structure and since Yamamoto specifically teaches that high adhesion levels are desired.

Regarding claim 13, the nickel coating formed by an alternate process such as the thermal spraying process stated above would inherently contain flattened droplets of metal.



Regarding claim 21, since Yamamoto teaches a surface layer is made of the same materials as that claimed by Applicant, it is expected to be able to withstand the same high temperatures as the claimed invention.

8. Claims 2-5, 10-11, 22-28, 32-34, 37-38 and 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eder (US 3,092,306).

Regarding claims 2-5 and the method limitations contained therein, the claims are drawn to a product, not the method of making. Absent a teaching of the criticality of the specific spraying methods which are claimed, they do not provide a patentable distinction over the prior art. Furthermore, it would have been obvious to one of ordinary skill to have used any known spraying process as a means to form the sprayed coating on the compressor of Eder.

Regarding claims 10 and 32, although Eder is silent to the aluminum being 99% pure, it does not teach that the aluminum is alloyed with any other material. Therefore, it would have been obvious to one of ordinary skill in the art to have selected an essentially pure aluminum as the coating material for the compressor of Eder since no other material is suggested.

Regarding claims 11, 33, 22 and 43, Eder teaches what is set forth above however it does not teach that the thicknesses of the individual layers are within the range claimed by Applicant. However, it is the position of the Examiner that, absent a showing of the criticality of the claimed layer thicknesses, such thicknesses would merely be a design choice and are not seen to provide a patentable distinction over the

art of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used any thickness of each material layer so long as it provided sufficient protection to the compressor substrate.

Regarding claims 23-28, 32-34, 37-38 and 42-43, although Eder is silent to the surface layer being a silicon resin acrylic sealant, it does teach that well known silicone resins may be used (col. 3, ln. 20-37). It would have been obvious to one of ordinary skill in the art to have used any known silicon resin, including the claimed resin. Absent a teaching of the criticality of the specific type of resin claimed, it does not provide a patentable distinction over the prior art.

9. Claims 29-31 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eder (US 3,092,306) as applied to claims 2-5, 10-11, 22-28, 32-34, 37-38 and 42-43 above and in further view of Yamada et al. (US 6,337,141).

Eder teaches what is set forth above however it is silent to the prayed layer containing magnesium and the surface layer containing inorganic particulates.

Regarding claims 29-31, Yamada teaches a compressor having a flame sprayed aluminum coating which may contain magnesium in an amount less than 3% in order to enhance the wear resistance of the coating (col. 3, ln. 57-61). It would have been obvious to one of ordinary skill in the art to have used aluminum alloys, such as alloys containing magnesium, as the sprayed layer for the compressor of Eder in order to produce a coating having enhance wear resistance.

Regarding claim 39, Yamada further teaches that an organic surface layer may be added to the sprayed coating wherein the surface layer has inorganic particles such as solid lubricants which assist in providing the coating with enhanced seizure-resistance (col. 5, ln. 56-63). It would have been obvious to one of ordinary skill in the art to have included inorganic particles in the surface layer of Eder in order to produce a surface layer having enhanced seizure-resistance.

10. Claims 36 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eder (US 3,092,306) as applied to claims 2-5, 10-11, 22-28, 32-34, 37-38 and 42-43 above and in further view of Sugiura (US 6,378,415).

Eder teaches what is set forth above however it is silent to the surface layer containing metal particles such as aluminum. Sugiura teaches a spray coated compressor having a surface layer containing metal particles which provide the coating with enhanced durability (col. 2, ln. 23-42). Sugiura further teaches that the metal particles may comprise aluminum (col. 3, ln. 49-57). It would have been obvious to one of ordinary skill in the art to have added metal particles such as aluminum to the surface layer of Eder in order to form a coating having enhanced durability.

11. Claims 3-5, 11, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US 6,337,141).

Regarding claims 3-5 and the method limitations contained therein, the claims are drawn to a product, not the method of making. Absent a teaching of the criticality of

the specific spraying methods which are claimed, they do not provide a patentable distinction over the prior art. Furthermore, it would have been obvious to one of ordinary skill to have used any known spraying process as a means to form the sprayed coating on the compressor of Yamada.

Regarding claims 11 and 22, Yamada is silent to the thicknesses of the individual coating layers. However, it is the position of the Examiner that, absent a showing of the criticality of the claimed layer thicknesses, such a thickness would merely be a design choice and is not seen to provide a patentable distinction over the art of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used any thickness of each material layer so long as it provided sufficient protection to the compressor substrate.

Regarding claim 19, Yamada is silent to the inorganic particulate being aluminum. However, it does teach that the organic layer may contain soft metal materials such as Sn and Pb-Sn (col. 5, ln. 56-58). Absent a teaching of the criticality of the specific claimed material, it does not provide a patentable distinction over the prior art. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used any soft metal in the organic coating of Yamada since the two materials cited are merely stated as preferred embodiments. The disclosure that soft metals may be included is not limited to solely the preferred embodiments.

12. Claims 2-5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanayama (US 6,123,009).

Regarding claims 2-5 and the method limitations contained therein, the claims are drawn to a product, not the method of making. Absent a teaching of the criticality of the specific spraying methods which are claimed, they do not provide a patentable distinction over the prior art. Furthermore, it would have been obvious to one of ordinary skill to have used any known spraying process as a means to form the sprayed coating on the compressor of Kanayama.

Regarding claims 22, Kanayama is silent to the thickness of the surface layer. However, it is the position of the Examiner that, absent a showing of the criticality of the claimed layer thickness, such a thickness would merely be a design choice and is not seen to provide a patentable distinction over the art of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used any thickness of the surface layer so long as it provided sufficient protection to the compressor substrate.

13. Claims 2-5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiura et al. (US 6,378,415).

Regarding claims 2-5 and the method limitations contained therein, the claims are drawn to a product, not the method of making. Absent a teaching of the criticality of the specific spraying methods which are claimed, they do not provide a patentable distinction over the prior art. Furthermore, it would have been obvious to one of ordinary skill to have used any known spraying process as a means to form the sprayed coating on the compressor of Sugiura.

Regarding claim 11, Sugiura is silent to the thickness of the sprayed layer. However, it is the position of the Examiner that, absent a showing of the criticality of the claimed layer thickness, such a thickness would merely be a design choice and is not seen to provide a patentable distinction over the art of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used any thickness of the sprayed so long as it provided sufficient protection to the compressor substrate.

***Allowable Subject Matter***

14. Claims 20, 35 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Claims 44-46 are allowed

***Reasons for Indicating Allowable Subject Matter***

16. The prior art teaches compressors having protective coatings wherein a metallic layer is sprayed onto the compressor and a surface layer is applied thereon. However, the prior art is silent to forming a compressor having a protective coating wherein the organic surface layer comprises an ultraviolet stabilizer.

The prior art further teaches that a variety of surface layer compositions may be employed however they do not teach or suggest the specific compositions which are claimed in claims 35 and 44-46.

17. Any inquiry to this communication or earlier communications from the Examiner should be directed to Jason Savage, whose telephone number is (571)272-1542. The Examiner can normally be reached Monday to Friday from 6:30 AM to 4:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Deborah Jones, can be reached on (571)272-1535.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jason Savage

6-22-04

  
DEBORAH JONES  
SUPERVISORY PATENT EXAMINER